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ABSTRACT

This paper outlines trends in organizational communication studies and proposes that organizational communication be studied through the interaction effects of the medium used in the communication (telephone, television, facsimile, or other media), the type of communication (persuasion, information flow, or negotiation), and the structure of the organization (bureaucratic, laterally integrated, or vertically integrated). Two assumptions underlie the research plan and are based on reviews of organizational studies and of technological advances in organizational communication: (1) the relationship between technology and communication within organizations must be stated in systematic rather than static terms because each element in the system is affected by every other element, and (2) the effect of a medium cannot be studied in general terms because it varies with the communication. The flexibility built into this research approach enables various combinations of medium, message, and organizational structure to be compared for their effectiveness in specific situations. (RL)

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# TECHNOLOGY IN ORGANIZATIONAL COMMUNICATION: A PLAN FOR STUDY

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TECHNOLOGY IN ORGANIZATIONAL COMMUNICATION: A PLAN FOR STUDY.

The way in which people are organized makes a difference to the way they communicate. A variation of this statement, in fact, is given by Charles Redding as a basis for the study of Industrial Organizational Communication.[1] This paper takes Redding's rule that "organization makes a difference" as a datum, outlines general trends in organizational communication since the discipline started, and makes a case for the study of the effects of the present and future technology on the way people communicate in organizations. The advent of new technologies effects not only a difference in the mode of communication within an organization, but also brings about far-reaching changes in the physical structure of the organization. Thus the task of trying to clarify and understand the impact of technology on the communication-within-organizations is daunting, and while accurate prediction is obviously impossible, because of the pace with which the technology of communication is progressing, and the relative lack of any knowledge of its effects, an organized program of study is definitely in order.

This paper proposes a plan of study in which the interactions of each medium of communication (telephone, television, facsimile, and other media), each type of communication (persuasion, information flow, negotiation, or other categories), and the structure of the organization (bureaucratic, laterally integrated, vertically integrated or other structure) would be experimentally determined. Because it is obvious today that universally acceptable guidelines regarding media usage must be modified by the factors affecting particular cases, and that

isolated cause-and-effect media studies, when rigorously conducted, are rarely generalizable, the plan of study of media-content-organizational structure is a rational solution to a problem which isolated and uncoordinated efforts cannot possibly solve. While certainly extensive, the outlined plan is simple in design, and practical for a team of researchers to complete in a few years.

Organizational Studies To Date.

In his overview of organizational theory and research, Richetto borrows from Dover to describe the "eras" of management communication--- a precursor of today's organizational communication field.[2] In the thirties, corporate communication was mostly superficial, "to keep the workers happy." This was described as the "Era of Entertainment." The 1940's brought the "Era of Information" which reflected an increased effort on the part of management to apprize workers of corporate goals, procedures and other relevant information. As the behavioral scientist became increasingly involved in corporate communication, the 1950's brought the "Era of Interpretation and Persuasion." For example, Richetto reports on one valuable area of research interest: "Problems specific to upward-initiated communication began to appear in the 1950's, focusing on the attention for lower level persons to 'filter' or otherwise distort their upward directed messages." The trends of the 1950's continued through the 1960's, and subsequently theory and research relevant to organizational communication became more complex. The climate studies, referred to by most texts today, which were generated by the Purdue group, began at this

time, and focused chiefly on organization members' perceptions of communications phenomena. Taxonomies were developed during this decade, along with a movement from laboratory to natural organizational settings, and theory building progressed.

The 1970's saw the continuation of the climate studies as well as information flow and message content studies. The actual topics of individual studies reflected the times. For example, studies of male compared with female, or black compared with white communication are typical. A survey of current organization communication preoccupations can perhaps be best approximated by analyzing the table of contents of a widely accepted textbook in the field. For example, Goldhaber's text, Organizational Communication is divided into four parts: 1) The Behavior of Organizations; 2) The Process of Communication; 3) Interaction Formats in Organizations; 4) Intervention Formats in Organizations.[3]

The Behavior of Organizations section is divided into a definition and explanation of communication theory and a description of the classical (that is, bureaucratic), human relations, and social systems schools of thought on organizations. The Process of Communication section deals with communication as an abstract phenomenon and its transactional, serial, and personal aspects. Networks and diffusion are also considered, as is the role of speech and non verbal communication. While the communicative aspects of environment (for example, office layout) are considered, the technology of communication is ignored.

The third part of the text is the Interaction Formats section. Dyadic

relations in organizations are studied from a transactional analysis perspective, and small group theory and public communication are described. The fourth part of the text entitled Intervention Formats concerns the mechanics of field research, communications training and consulting.

While quite different in outline and approach from Goldhaber, Communicating and Organizing, a text by Farace, Monge and Russell, resembles Goldhaber in that it does not discuss technology as a factor in organizational communication.[4] Hellriegel and Slocum in Organizational Behavior: Contingency Views devote a couple of pages to technology-focused approaches to organizational change. They state:

> The technological approach is probably the most pervasive and common contemporary perspective for explaining change in organizations, change in society and institutions, changes in people (by wiping out certain types of jobs and creating new ones), creation of new organizations, elimination of established organizations, and growth in large scale and multi-national organizations.[5]

Even though Hellriegel and Slocum consider the technological approach the most pervasive, they give it little prominence in their text, perhaps because they are so aware of the literature of organizational communications and wish to cover this field. Thus while they are aware of the present predominance of the technological influences on communication in organizations, they apparently realize that the ramifications of this phenomenon are not yet explained nor even understood.

These authors, along with Farace, Monge and Russell and most other modern authors, are committed to a systems approach, in which, as they explain: "In the simplest sense of the word, everything is related

to everything else."[6] With this viewpoint, the goals of the organization, and the roles and competencies of the individuals within the organization, are analyzed within a complex chain of interdependence, but the goals, roles and competencies can also be singled out as entities which can be understood or controlled.

Under a chapter heading "Organization Structure and Climate," Hellriegel and Slocum discuss bureaucracy using the Seven-Eleven stores as an example; the autonomous or self-contained unit structure with the Volvo automobile company as an example; the lateral relations style of organizational communications with the Hershey candy bar company; and the vertical information systems style is exemplified by British Petroleum.

Briefly, the bureaucratic model is the traditional "chain-of-command" model in which the individual is given information from above in the form of orders, procedures, and work rules. This is the traditional military system "designed by geniuses to be run by idiots." The autonomous or self-contained unit structure uses teams which take responsibility for meeting assigned goals, and allows flexibility within the team. The well-known Volvo strategy to prevent worker tedium and absenteeism by changing the linear assembly line to a modular working arrangement is described. Here inventory was accumulated between teams of workers, and if sufficient inventory was accumulated at the output of the module, the teams could set their own pace and procedures. The lateral relations model entails information flow (and hence decision

making) across individuals at the same level in the hierarchy, and means relatively less information flow up and down the hierarchical ladder than does the bureaucratic model. The vertical information system allows each individual in the hierarchical chain to have access to information and so to make decisions. For the most part, this entails the use of computer technology.

With regard to the technology of communication, while Hellriegel and Slocum admit that it "may be desirable to utilize lateral mechanisms to a greater extent as the degree of uncertainty, differentiation between departments, and desired integration (coordination) between departments increase"[7]---a likely concomitant of the introduction of communication technology---it is the vertical information system strategy which is specifically linked to computers and related information technology. They also point out that this system is often used in conjunction with other strategies. Benefits of vertical information systems are cited as the increase in interest and creativity on the part of workers and the enlargement and upgrading of jobs.

Effects which might generate problems include worker displacement, fewer departments and levels in the organization, and downgrading of the middle manager role. Hellriegel and Slocum quote authorities to show that computer-based information systems can cause either centralization or decentralization of an organization. They also provide a table which outlines the major impacts of technology on society and organizations along seven dimensions: goal accomplishment, unintended effects, knowledge

of effects, alternatives, new needs and goals, tools and self knowledge. The findings are predictable: computer information technology helps the organization reach its goals (else why use it in the first place?), but there are unexpected side effects (into which the usage of the computer itself will provide insight), and the computer brings new ways of looking at problems, new techniques and options.

The Effect of Communication Technology on Organizations.

The effects of the technology of communications on organizations are not felt with the invention or demonstration of hardware. It is only when both hardware and software are readily available and systematically promoted and maintained by powerful interests that change occurs. When, in January 1977, the Federal Communications Commission admitted the giant I.B.M. Corporation into the satellite business, both of the latter conditions seemed to be met. I.B.M. will be a partner in the new company called Satellite Business Systems, an enterprise which includes Comsat and Aetna Life and Casualty Company. S.B.S. plans to provide electronic linkage to plants and offices anywhere in the country, bypassing all existing landlines. Each customer would rent a dozen or more earth stations and be capable of sending messages to and from each station via the satellite. As a Fortune magazine article by Bro Uttal describes:

> The satellite's capacity is so large that customers will be able to send data hurtling among their operations at more than 650 times today's prevailing speeds. That stunning acceleration will permit a company to tighten its control over remote operations by increasing the amount and timeliness of the data it can gather on inventories, sales, production, etc. The consequences---for efficiency, organizational structure, and management style---could transform the way America does business.[8]

While it has been known for some time, for example David Sarnoff was saying this fifteen years ago, that voice, video, computer or graphic information were all so much bits of electronic data, standard satellite communication today requires the leasing of separate channels to carry different kinds of information. "The new system," claims Uttal, "will carry all of these on one channel, which can be adjusted by means of some slick electronics to a user's changing routes, traffic density, and types of messages." While there is always doubt of the success of any single business enterprise, the technological imperative seems to apply in this case. If S.B.S. fails, Fortune claims, the F.C.C. will allow A.T. & T. into the satellite market. The Commission has been holding back the giant corporation to allow smaller competitors to survive, and should it enter the field, the prospects for success are indeed greater. Even I.B.M., the computer manufacturer, and partner in S.B.S., is expected to prosper with A.T. & T's entry, as the satellite connection is expected to stimulate further purchase and usage of computer hardware and software. By thus expanding the market, the whole field could be expected to prosper.

A similar bright present and future is seen in the trade journals for corporate television. Synopses of the Brush report, which is the accepted authority for corporate television statistics, reveal that by the end of 1977, seven hundred businesses and non profit organizations had television production facilities.[9] 46,000 complete video programs of 15,000 hours duration for an expenditure of half a billion dollars

are the aggregate figures for 1977. Extrapolating current trends to 1980, the projection is for a 1.5 billion dollar industry. The Hope Reports, long an accepted authority for the audiovisual industry, independently presents a similar picture.[10]

Along with the growth of hardware and software, the demand for management expertise grows. Broadcast Management and Engineering, a trade journal, reports that there are now ten newsletters and magazines serving non-broadcast television applications, and textbook writing and consulting in the field seem to be a growth industry. The quality of the corporate television productions, claims this broadcast-directed magazine, approaches professional broadcast standards most of the time, and in many cases equals and even exceeds those standards.

The application of the new media may owe something to the 1950's "Era of Interpretation and Persuasion" as, regarding the use to which television is put, BME reports:

> The most significant latest development is "corporate communications." Since so many citizens have such a low view of industry and business these days, top management is going before the camera to win the hearts and minds of its own employees at the least. To the extent that the company is successful, it ends up with more satisfied employees and it can even motivate passage of legislation that may be harmful to business.[11]

Among corporations cited as using television in the above manner are Gulf Oil, Illinois Bell, and Phillips Petroleum.

Certainly, this type of application of television would seem to strengthen the bureaucratic chain-of-command system. Whether the distribution system is by wire, by the physical transportation of videocassettes,

or by satellite, the crucial point is that the content is programmed from the top. It would require a major change in the application of the technology, something parallel to the public access type of television which is appearing at different places all over the world,[12] to give corporate television a different structure. The relatively recent failure of the videophone to catch on also is a negative indicator as to the likelihood of any change in the direction of two-way communication.

Teleconferencing in business and industry, and educational aspects of telephone usage as exemplified by the University of Wisconsin's Educational Telephone Network, provide two-way communication which is a significant break from the traditional television technique of one-way only communication. While two-way communication seems to be a mitigating strategy, there remains the significant question as to the desirability of face-to-face rather than some mediated communication for members in a corporate structure. Albertson reports on a study conducted by Morley and Stephenson:

> They compared the effectiveness of "outcomes" of telephone and face-to-face negotiations in resolving a simulated management-union dispute. It was found that using the telephone significantly increased the chances of success of the side with the case previously rated as stronger, but in the face-to-face condition the side with the weaker case was able to obtain more concessions.[13]

Thus, it should depend on the type of information or negotiation which is communicated or conducted, as to whether or not a party with information to impart might select one or another channel of communication. For everyday information, any channel will do, but for information which might affect the interests of the informant, careful selection of the

channel would be required.

Albertson reports on a series of laboratory studies by the Communications Studies Group at London University:

> The most fundamental finding is that the effectiveness of a medium cannot be stated in general terms, because it varies with the nature of the communication. Using a range of communication media (usually telephone, closed circuit television, and face-to-face communication), the Group found that, within wide limits, a simple exchange of information is not affected by the medium. Any differences reported were in the direction of an audio-only link; for instance, as measured by the proportion of the communication recalled by the experimental subjects, the telephone is more effective than either video or face-to-face communication. On the other hand, communication which involves interpersonal influence (such as resolving conflicts, and persuading) is sensitive to the medium of communication, in that the outcomes of the communication vary qualitatively across media.

While electronic media such as computer, television, and facsimile gain much current attention, other areas of technology may have far-reaching effects in organizations. The Kodak company has been promoting its intraorganizational filmmaking systems. These systems profit from the low cost of equipment afforded by the economies of scale provided by the consumer market. When Super-8 cameras and projectors are manufactured in the millions for the consumer market, their employment for corporate communication can be remarkably inexpensive. Color and sound Super-8 films can be easily shown on television with the inexpensive Videoplayer, and the small Super-8 projectors are without equal in portability, so the demonstration and display part of the system is within the reach of virtually all organizations. The customized sound-slide presentation has become such a feature of orientation

programs and sales presentations in business, that the temptation is to forget that it is a medium worthy of consideration as far as its implications to organizational communications are concerned.

The largest impact of technology on organizational communications may not be caused by any of the above media, but rather in the change in office procedures caused by the advent of information processing within the office. As Fortune reports: "Today's office stands as the most labor intensive sector in our society; yet labor costs are rising at a steady 6% - 8% each year while the price of automated technology is falling at the 10% - 20% rate."[14] If this is so, a drastic change in office procedure is imminent. The hardware is being marketed by well established corporations: Word processing equipment by I.B.M., Olivetti, Norelco, Burroughs, Xerox; Display equipment by Vydec (Exxon), and 3M; Micrographics by Kodak, 3M and Xerox; Facsimile by Xerox, 3M and Qwip (Exxon) and High Speed Office printers by Xerox and Exxon. It may be significant that the corporation most associated with the oil business, Exxon, is heavily involved with the new intelligent typewriters, voice recognition and automated telephone answering devices. Thus the standard office, which has remained virtually unchanged (from a systems standpoint) for over a century, seems to be positioned for a technological revolution.

In an age of freedom of information acts, where consumer and other activist groups are intensely aware that knowledge is power, it is reasonable to assume that the lowliest office worker will be aware of the relation of access to information and his or her self interest.

Information flows will perhaps be affected when office workers are entering source data into intelligent terminals and data records are filed into computer memory. As Fortune puts it: "The filing cabinet and its relatives will go the way of the buggy whip,"[15] and the keepers of those files will be reorganized. With regard to security, while the first amendment and Daniel Ellsberg are most remembered in the celebrated leak of the Pentagon Papers, the technology of photocopying should also be given due note. The technology itself thus provided the opportunity for a course of action as, in this case, it seems unlikely that the amount of information could have been leaked without photocopying. While security countermeasures can be taken with all developments and changes, it is not inevitable that technology aids in a 1984-style information control as has been surmised in the popular speculation, as more freedom of information may equally well be the result.

A Plan For Research.

To clear up much of the uncertainty, a plan for research into the effects of the technology of communication on organizational communication is very much in order. Two assumptions must be made in light of current knowledge. The first assumption is that the relationship between technology and communication within organizations must be stated in systematic rather than static terms, as each element in the system is affected by every other element. The second assumption (which is inherent in the first) is that the effect of a medium cannot be studied in general terms, because it varies with the communication.

With these assumptions accepted a matrix of relationships could be compiled. Forerunners of this type of compilation are Allen's well known chart comparing learning objectives with various media,[16] or by McLuhan's media charts.[17] The difference would be that in the proposed matrix, opinion and speculation would be replaced with scientific findings, a task that must be left for the future, as present knowledge can only leave many of the cells empty.

On one axis of a third dimensional array would be the medium: telephone, face-to-face, video display via computer, facsimile and so forth. On another axis would be the yet-to-be-determined type of content to be communicated. Perhaps a distinction between information, persuasion, or negotiation would be in order. On the third axis would be the type of organization using the system. Perhaps bureaucratic, laterally integrated, and vertically integrated divisions would be appropriate. The combinations could then be compared for effectiveness. Perhaps a letter to a bureaucracy might be more persuasive than a phone call, but a phone call to a laterally integrated organization might elicit information more promptly. The various combinations could be explored, and the system expanded by factoring in other variables such as upward directed communication or downward directed communications.

The measure of effectiveness, (the dependent variable) could be changed to generate a family of matrices. If a cost/time index (e.g. dollars per minute) was chosen it might be an appropriate measure of effectiveness for some applications, but not for others. Accuracy

might be much more important if lives were at stake, and an indicant of accuracy would then have to be devised.

The simplicity of the above system is beguiling, and the amount of information to be obtained from it substantial. However, it is dependent on a considerable amount of basic research into the effects of communication technology on organizational communications which is yet to be accomplished.

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